Module 1

Overview of

Environmental Management Systems

An Environmental Management System (EMS) provides a systematic way to review and improve operations for better environmental performance. An EMS can help a company better meet its compliance requirements. It can also help a company use materials more efficiently and streamline operations, thereby reducing costs and becoming more competitive. The EPA National Enforcement Investigations Center (NEIC) has recognized the contribution of an EMS in improving a company's compliance record by providing a guidance document for developing a "compliance-focused" EMS.¹

The most commonly used framework for an EMS is the one developed by International Organization for Standardization (ISO) for the ISO 14001 standard. Established in 1996, this framework is the official international standard for an EMS.

While the EMS described in this manual is based on the ISO 14001 approach, the process outlined in this manual does not provide for meeting all the requirements of that standard.

The five main stages of an EMS, as defined by the ISO 14001 standard, are:

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An EMS is a framework for managing those significant environmental aspects you can control and those over which you have an influence.

¹"Compliance-Focused Environmental Management System — Enforcement Agreement Guidance," EPA-330/9-97-002, USEPA, Office of Criminal Enforcement, Forensics and Training, August 1997.

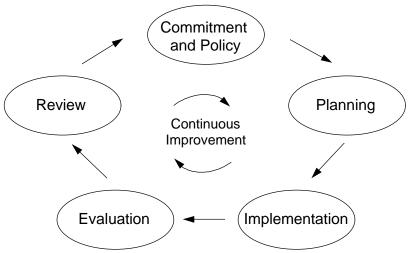


Figure 1. The Continuous Improvement Cycle

- Commitment and policy: top management commits to environmental improvement and establishes a company environmental policy.
- Planning: the company conducts a review of its operations, identifies legal requirements and environmental concerns, establishes objectives, evaluates alternatives, sets targets, and devises a plan for meeting those targets.
- ► Implementation: the company follows through with the plan by establishing responsibilities, training, communication, documentation, operating procedures, and an emergency plan to ensure that environmental targets are met.
- Evaluation, where the company monitors its operations to evaluate whether the targets are being met, and if not, takes corrective action.
- ► **Review:** the EMS is modified to optimize its effectiveness. The review stage creates a loop of continuous improvement for the company.

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Continuously identifying and reducing risk leads to improved competitiveness and environmental performance. Using the approach provided in this manual, you can develop a DfE/EMS that helps you continuously identify and reduce risk to people and the environment. By focusing on reducing risk and more efficient natural resource use, improvements in environmental performance will be built into your DfE/EMS. This manual provides methods to help you consider risk reduction when answering the following questions:

- 1) How does your company **impact the environment**?
- 2) Which **environmental impact**s are **significant**?
- 3) How can your company **improve** its **environmental performance**?

What are the steps in developing a DfE/EMS?

The modules are laid out to provide a step-by-step guide through the process of creating an EMS that incorporates DfE principles and that uses the DfE technical approach to evaluate alternatives for improvement in a selected area. Each module contains worksheets to assist you in completing the work. The focus of the manual is on the technical work. The appendix contains modules on stakeholders, communication, and documentation to assist you in completing those parts of your EMS when you are ready to work on them. The Appendix also contains a "toolkit" of blank forms that correspond to the worksheets in each module. There are also additional case studies and a glossary in the Appendix. In addition to the Appendix, more tools and guidance can be found on the DfE/EMS website at http://www.epa.gov/opptintr/dfe/index/html.

Module 1: Overview of Environmental Management Systems.

Provides a general discussion of what an EMS contains and the process of developing one.

Module 2: Laying the Groundwork.

Build support for your DfE/EMS by making a presentation to your company's managers and employees on what an EMS is and why the company is developing one. This presentation will help to develop support and understanding of the DfE/EMS within your company. In addition, you will need to develop an understanding of how your company currently manages environmental concerns. You may already have policies in place that can be part of an EMS. Understanding your company's approach to environmental concerns will help you identify areas for improvement. Discussion questions designed to help understand your current efforts are included.

Module 3: Making the Commitment: Creating an Environmental Policy Statement and Determining the Scope of Your DfE/EMS.

You will begin the process of developing a DfE/EMS by writing your company's environmental policy statement and deciding how much effort you want to expend at the start. This policy will be based on what is important to your company. The module contains a set of discussion questions that will help draw out company concerns and values. It also contains some sample principles and policy statements.

Module 4: Planning the Process: Decision Points, Leadership & Participants, Schedule & Plan.

Next, you will create a plan for the DfE/EMS effort. This plan includes determining who will oversee plan implementation and who will participate in the process. It includes a schedule for meetings and for completing each step. In addition, there are recommendations for initial steps in identifying stakeholders, developing a communication plan, and preparing documentation.

Module 5: Identifying Environmental Aspects: Understanding Your company's Possible Impacts.

Your company's **environmental aspect**s are any of your activities, products, or services that can have an impact on the environment. In order to identify potential environmental concerns you should consider regulations, inputs and outputs of various company activities from office work to production processes and the environmental effects of those activities. This module lays out a method for developing and organizing that information as it relates to your company.

Module 6: Determining Significant Aspects: Prioritizing Concerns and Setting Objectives.

You will need to determine which environmental aspects are significant and to prioritize them to determine what you want to address first. This module describes a method for making a judgement about environmental risk so as to prioritize environmental aspects. The module also helps to translate the results of prioritization into objectives to reduce environmental impact using practical, cost-effective criteria.

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You should not try to perfect or even complete each step on your first attempt. Many of the steps will need to be revisited as you proceed with developing the EMS.

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are elements of your business, such as air pollutants or hazardous waste, that can have negative impacts on people and/or the environment.

Module 7: Setting Standards: Developing Operational Controls.

All significant environmental aspects should have standards set to provide guidance that will minimize environmental impact. This module lays out how to develop operational controls, measure for success of those controls, and provide corrective action when necessary.

Module 8: Making Improvements: Evaluating Alternatives and Setting Targets.

Your environmental projects lay out how you plan to achieve your targets. It is important to consider a wide array of approaches before designing a project to meet objectives. This module shows how the DfE technical methodology considers a hierarchy of alternatives which include substitutes, pollution prevention and wise resource management.

Module 9: Setting Up Environmental Management Projects; Measuring and Achieving Success.

You will implement your environmental project by assigning responsibilities and making desired changes in procurement, processes, or work procedures to meet your targets. It is also important to review progress at regular intervals and design ways to measure the success in meeting targets.

Module 10: Establishing Continuing Improvement: Your DfE/EMS Program, Audits, and Management Review

To ensure success and continuing improvement, regular reviews of your DfE/EMS are needed. Management reviews should be scheduled regularly to check on progress of the DfE/EMS and of the environmental programs set up to meet targets. The EMS review would include progress made in communication,

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The EMS is an internal management tool. How much you choose to do and whom you choose to include as participants is entirely the decision of you and your company. Reviews of your company's performance are conducted by your own firm and the results revealed at your discretion.

documentation and developing stakeholders as well as the specific environmental targets. This review provides the basis for continuing improvement.

How much work each of the steps entails depends entirely on how large your company is and the scope of work that you decide to undertake. It is not necessary for your DfE/EMS to include all your operations, especially for your first effort. As you grow in experience in managing environmental concerns along with your daily operations, you will develop your DfE/EMS further.

Road Map Between ISO14001 and DfE/EMS Approach

ISO14001 EMS Components	DfE/EMS Manual Modules
Commitment and Policy	Module 2: Laying the Groundwork Module 3: Making the Commitment: Creating an Environmental Policy Statement and Determining the Scope of Your DfE/EMS
Planning	Module 4: Planning the Process: Decision Points, Leadership & Participants, Schedule & Plan Module 5: Identifying Environmental Aspects: Understanding Your company's Possible Impacts Module 6: Determining Significant Aspects: Prioritizing Concerns and Setting Objectives
Implementation	Module 7: Setting Standards: Developing Operational Controls. Module 8: Making Improvements: Evaluating Alternatives and Setting Targets Module 9: Setting Up Environmental Management Projects; Measuring and Achieving Success
Evaluation	Module 9: Setting Up Environmental Management Projects; Measuring and Achieving Success
Review	Module 10: Establishing Continuing Improvement: Your DfE/EMS Program, Audits, and Management Review

Module 2

Laying the Groundwork

Before building your DfE/EMS, you need to take two important steps. First, build both management and employee support for your DfE/EMS. Second, develop an understanding of how your company currently manages environmental concerns.

Step 1: Building Support for an EMS

It's important that both management and employees understand not only what an EMS is, but also why they would want one. This step is designed to get people to think about and discuss the ways in which an DfE/EMS would benefit your company.

First, set up times to discuss the following questions with managers and employees. Recording the discussion provides important documentation, which can be used to communicate the benefits of an DfE/EMS to others. These results may provide ongoing support for the development process. One way to record the discussion is to assign someone the task of writing answers on a flip chart, so that everyone can see them for discussion.

The first set of general questions will help you identify your need for an EMS.²

Which environmental and worker safety laws and regulations is your company required to follow?

Are you looking for ways to improve your overall environmental performance?

How does your company define environmental performance?

DfE Program

Experience has taught the importance of building support from participants through open and frequent discussion about mutual concerns.

²Adapted from: *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*. Ann Arbor, MI: NSF International, November 1996, p.3.

Does lack of time or resources prevent your organization from taking charge of its environmental obligations? Are there individuals appointed to be responsible for this function? Does your organization know how its **environmental objectives** relate to its business objectives?

To build support, consider the benefits a DfE/EMS might provide for your company. A more systematic approach to meeting your environmental and business goals might contribute to the following in your company:

- improved environmental performance
- improved worker health and safety
- improved competitiveness
- improved compliance and reduced liability
- fewer accidents
- improved public image
- enhanced customer trust
- better access to capital
- improved internal communication
- improved company morale

It will be helpful at this point to create a worksheet to compare the expected costs and benefits of developing a DfE/EMS. The table below provides some general categories of costs and benefits. When making your comparison, provide specific examples from the discussion.

Worksheet 2-1: Costs and Benefits of Developing			
and Implementing a DfE/ EMS ³			
Costs	Benefits		
staff/employee time for the following: information collection, read and understand manual, preparation of worksheets, facilitating EMS sessions, participating in EMS development	 improved environmental performance expected increased efficiency/reduced cost of materials new customers/markets enhanced employee morale 		

possible consulting assistance

- training of personnel in new procedures
- technical resources to analyze environmental impacts and improvement options
- resources required to make changes
- expected savings in compliance and record keeping requirements due to changes in materials used.
- reduced waste disposal/treatment costs

Step 2: Understanding How Your Company Currently Manages Environmental Concerns

This step is designed to help you review how your company currently handles environmental and human health concerns and compares current practice with where you would like to be. In some references, this is called a "gaps analysis" because it is designed to uncover ways to improve your management of these concerns. This step is best developed through group discussions with a group representing different functions in your company, especially line managers and line workers. You'll need to involve those that have the day-to-day working knowledge of your company's operations. It is important for everyone to understand your current efforts. In this way, they can then

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Remember to consider worker health and safety as well as people outside your plant when evaluating known health concerns.

³Ibid, p. 5.

explore ways that things might be done differently, so as to improve both environmental management and cost savings for your company.

Discussion Questions

- 1. Does your company have an Environmental, Health & Safety Policy?
 - ► Is this policy written down?
 - ▶ Where is it located?
 - ► How many employees know about this policy?
 - ► How did they learn of it? Is it included in a training or orientation program?
- 2. Who created this policy? How many contributed to its development? Do employees have the opportunity to make suggestions regarding environmental concerns?
- 3. What points are included in this policy?
- 4. Does your company have specific environmental or health & safety goals?
 - ► Are these documented?
 - ► How are these communicated to employees?
 - ► Is there a way of tracking whether goals are met?
 - ► Are there penalties within the company for not achieving the objectives?
 - ► Is there a way to change these goals when changes in processes, production, or activities occur? How are these changes communicated?
- 5. Does your company have a process to identify all environmental, health & safety regulatory requirements?

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Your discussion should be comprehensive and detailed enough to give you some idea of what will need to be done to develop a DfE/EMS for your company.

- ► Has your company conducted compliance audits?
- Has your company received any fines or penalties regarding corrective action?
- 6. How does your company evaluate risk to human health & safety and the environment caused by your business operations? How is this information incorporated into planning for business activities/production?
- 7. Is there a process within the company to review any changes in products or processes with an eye toward environmental concerns?
- 8. Who in the company is designated to be in charge of environmental, health & safety concerns?
 - ► Is that person(s) responsible for achieving environmental goals identified above?
 - ► Does that person have the training resources and management support to carry out the job?
- 9. What training is offered at your company that would support environmental objectives?
 - ► Do employees receive environmental, health & safety training? What percent of employees? Which ones?
 - ► How is that training documented? Where are the records kept?
 - ► Is there provision for regular training on environmental, health & safety requirements?
- 10. Does your company have a procedure for responding to suggestions regarding environmental concerns that it may receive from customers, neighbors, or employees?
 - ► Is there a process for soliciting and recording any

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As you discuss these questions, it will be beneficial to write down the answers for reference as you proceed with the following modules.

- "suggestions"? Where are these records kept?
- Is there a process for following up on any of these suggestions to be sure that appropriate action was taken?
- 11. How does your company keep track of its documents?
 - ► Is there a filing system?
 - ► How many people are familiar with the system?
 - How many people have access to it?
 - How could someone find information relating to environmental, health & safety concerns? Are there Material Safety Data Sheets (MSDS) available? Does your company have documented standard operating procedures for plant operations, emergencies, or document control?
 - How are decisions made about when to dispose of documents?
- 12. How does your company identify potential accidents or emergency situations?
 - Are emergency procedures documented?
 - How do employees find out about them? Is there regular training?
 - Are these procedures periodically tested, evaluated, and revised as needed?
 - Have there been failures in response to accidents or emergency situations?
- 13. Does your company have a way of measuring the environmental effects of any of its operations?
 - ► Are there records kept? How long?
 - Are these records reviewed regularly with an eye to whether performance has improved or worsened?
 - ► Are these results available during management planning

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Visit the DfE website for more tools related to gaps analysis:

http://www.epa.gov/opptintr/dfe/index.html

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